

1) The MASS DEP states the contaminated soils used to cap a landfill is safe for a child playing in it, exposed to it, or near it for 24/7 for 3 years. Have there been any studies on a healthy child stating that this is indeed safe? Yes, exposures by various routes to the contaminants in these soils have been studied. Have you conducted any studies on a healthy adult? Protective levels for children also protect adults.

The chemical concentrations in soil for use as daily cover or grading/shaping material at landfills were determined using the same risk assessment methodologies used by USEPA and MassDEP to establish similar health-based standards, such as those for drinking water and ambient air. There are no specific studies cited for the COMM-97 numbers, but numerous studies, as noted in the Question 5 response, have been conducted nationwide that validate the risk assessment methods used to set the COMM-97 criteria. Because children are a much more sensitive population than healthy adults to the potential effects of exposure to contamination, where the studies document a safe exposure level for children it follows that it will also be safe for adults.

2) Supposed that the child is exposed to it for more than 3 years, are there any studies indicating that it will continue to be safe?

The levels are set and applied so that an extended exposure period at these levels would be protective. Here are three examples: (1) the standards assume that the level of dust in the air is continuously (24/7 for 3 years) at the maximum allowable level of dust. The actual dust levels, even at operating facilities, rarely peak at such levels. (2) The standards assume that the average concentration of each contaminant is at the maximum allowable levels in all the soil used. The standards are actually applied as levels not-to-be-exceeded, so that the actual average value is substantially less than the average. (3) The toxicological information used to set each standard is developed by US EPA with adjustment factors to modify the values to be more protective for assumed variability in length of exposure, sensitivity to the chemical, etc.

3) What might be included in the Comm97? Lead, Asbestos etc...Please list the contaminants.

The COMM-97 policy is attached. The following table lists the chemicals and allowed levels in soil. Asbestos is not allowed.

Typically "COMM-97 soil" does not approach these upper limits, as the source of soil for cover/grading shaping is often construction sites that are shipping cleaner material, such as the natural marine clay material that underlies much of Boston. Note that these levels do not apply to the soil used as the final cover of the landfill.

CONTAMINANT	Reuse Levels (mg/kg) ¹	
	Lined Landfills	Unlined Landfill
Total Arsenic	40	40
Total Cadmium	80	30
Total Chromium	1,000	1,000
Total Lead	2,000	1,000
Total Mercury	10	10
Total Petroleum Hydrocarbons (TPH)	5,000	2,500
Total PCBs ³	< 2	< 2
Total SVOCs ²	100	100
Total VOCs ⁴	10	4
Conductivity ¹ (umhos/cm)	8,000 umhos/cm	4,000 umhos/cm
Listed or Characteristic Hazardous Waste (TCLP) ⁴	NONE	NONE

NOTES on Table:

1. The level mg/kg is synonymous with parts per million.
2. SVOCs are semi-volatile organic compounds
3. VOCs are volatile organic compounds
4. Footnotes can be found in the COMM-97 policy.

4) If you have the studies, how do I access the documentation?

Attached are the COMM-97 and two documents that provide the information on the development of the criteria in the table above.

5) If you have studies, how old was the child and to what extent was the child playing in it i.e., hands to mouth or running through it?

The child exposures are based on studies of soil ingested by children, ranging from infants in diapers to teens, while playing in dirt – such as incidental ingestion and skin contact.

The exposure factors used to develop the criteria – such as the amount of soil ingested, the amount of skin contacted, etc... are detailed in the attached documents and more extensively described in standard risk assessment texts, such as US EPA's Exposure Factors Handbook

(<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=20563>) and the MassDEP's Guidance for Disposal Site Risk Characterization (<http://www.mass.gov/eea/docs/dep/cleanup/laws/rc1.pdf>, <http://www.mass.gov/eea/docs/dep/cleanup/laws/rc2.pdf>, and <http://www.mass.gov/eea/docs/dep/cleanup/laws/rc3.pdf>)

6) If there were studies, how long have you studied the child for?

As noted above, there are no specific studies cited for the COMM-97 numbers, but numerous studies have been conducted nationwide that validate the risk assessment methods used to set the COMM-97 criteria.

7) Are there studies for airborne contamination? If so...was it on a child or an adult? How many years were the subjects studied?

As noted above, there are no specific studies cited for the COMM-97 numbers, but numerous studies have been conducted nationwide that include airborne dust.

8) If you have studies, how were the subjects studied? Visual, blood tests, urine samples, MRI, xrays etc...

As noted above, there are no specific studies cited for the COMM-97 numbers, but numerous studies have been conducted nationwide that validate the risk assessment methods used to set the COMM-97 criteria. These studies look at a range of health endpoints (depending on the chemical). The PCB example noted above looked at PCB serum levels.

9) Have you studied a child who is not playing in it but is an abutter to the contamination?

As noted above, there are no specific studies cited for the COMM-97 numbers. An underlying assumption is that risk of adverse effects is related to exposure, and that levels that are protective of higher exposure (such as playing in soil) are also protective for less exposed individuals (i.e., someone who plays in the soil less frequently, or someone who lives nearby, but not on the property of concern.)